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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/715,041	11/20/2000	Sang-Jun Choi	SEC.741	6853

20987 7590 09/20/2004

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EXAMINER

THORNTON, YVETTE C

ART UNIT	PAPER NUMBER
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1752

DATE MAILED: 09/20/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/715,041

Applicant(s)

CHOI ET AL.

Examiner

Yvette C. Thornton

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 09 August 2004.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-2, 4-6, 9-18 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1,2,4-6 and 9-18 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
- 1) ☒ Certified copies of the priority documents have been received.
 - 2) ☐ Certified copies of the priority documents have been received in Application No. _____.
 - 3) ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

This is written in reference to application number 09/715041 filed on November 20, 2000.

Response to Amendment

1. Claims 3 and 7-8 have been cancelled. Claims 1-2, 4-6 and 9-18 are currently pending.
2. The amendments to instant claims 1 and 5 are sufficient to overcome the rejection under 35 U.S.C. 112, first paragraph set forth in the previous office action.

Request for Continued Examination (RCE)

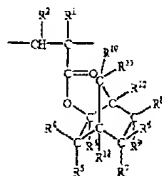
3. The request filed on August 9, 2004 for a Request for Continued Examination (RCE) under 37 CFR 1.53(d) based on parent Application No. 09/715041 is acceptable and a RCE has been established. An action on the RCE follows.

Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

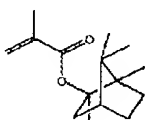
5. Claims 1-2, 4-6, 9-15 and 17 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kinsho et al. (US 6312867 B1). Kinsho teaches a polymer comprising units of an ester compound having the given general formula (1a) and having a weight average molecular weight of 1,000-500,000 (c. 2, 1.



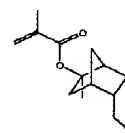
64-67). Formula (1a) has the following structure

. Illustrative non-limiting examples of

formula (1a) include

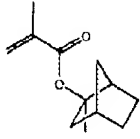
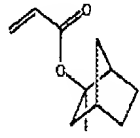
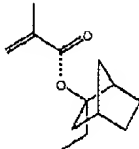


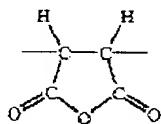
(R2=2-methyl-2-isobornyl; R1=methyl),



(R2=8-methyl-

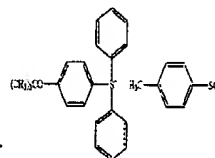
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8-tricyclodecanyl; R1=methyl),  (R2=2-methyl-2-norbornyl; R1=methyl), 
 (R2=2-methyl-2-norbornyl; R1=H) and  (R2=2-ethyl-2-norbornyl; R1=methyl), all which meet the limitations of the first monomer of the instant claims (see c. 7, l. 66-c. 9, l. 35; c. 44, l. 40-c. 47, l. 29). It is the examiner's position that formula (1a), specifically the said examples meet the limitations of the claimed repeating unit "m". Kinsho teaches that the said polymer may further comprise recurring units of at least one of formulae (2a) to (13a) (see c. 3, l. 20-c. 5, l. 22). Formula (10a) has the structure:



which meets the limitation of the claimed repeating unit "n". Kinsho clearly teaches that it is more preferable for the polymers of the taught invention to contain (I) 30-80 mol% of units of formula (1a) derived from formula (1), (II) 5-90 mol% of units of one or more types of formulae (2a) to (13a) and optionally (III) 0-50 mol % of one or more types derived from the additional monomers (iii) (c. 20, l. 18-34).

Kinsho further teaches a resist composition comprising the said polymer, a photoacid generator and an organic solvent (c. 21, l. 10-15). Kinsho exemplifies photoresist compositions (I-37 and I-39)



comprising polymers 37 and 39 admixed with a photoacid generator (PAG1), which is a triarylsulfonium salt; tributylamine, which is an organic base; and a solvent PGMEA. The preferred photoacid generators include triphenylsulfonium trifluoromethanesulfonate (triflate), triphenylsulfonium p-toluenesulfonate and bis(n-propylsulfonilyl) diazomethane (c. 26, l. 8-39; see also PAG2 c. 69, l. 30-40).

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Kinsho further teaches that especially preferred basic compounds include tertiary amines (triethylamine, tributylamine, tri-isobutylamine and trioctylamine); aniline derivatives and hydroxyl group-bearing nitrogenous compounds (c. 35, l. 26-35). The given examples use tributylamine (TBA), triethanolamine (TEA), trimethoxymethoxyethylamine (TMMEA) and trimethoxyethoxymethoxyethylanine (TMEMEA) (c. 70, l. 56-59). Kinsho also teaches that the resist composition of the taught invention may include as an optional ingredient, a surfactant that is commonly used for improving the coating characteristics. Optional ingredients may be added in conventional amounts so long as this does not compromise the objects of the invention. Nonionic surfactants are preferred, examples of which include perfluoroalkylpolyoxyethylene ethanols, fluorinated alkyl esters and fluorinated organosiloxane compounds (c. 41, l. 45-62). It is the examiner's position that perfluoroalkylpolyoxyethylene ethanol meets the limitation of a polyether as set forth in instant claim 17. The examples teach the preferred embodiments of Kinsho.

One of ordinary skill in the art would have been motivated by the teachings of Kinsho to develop a photoresist composition comprising the a polymer of formula (1a) in combination with the preferred monomer (10a); a preferred photoacid generator such as that exemplified by PAG2; a preferred organic base such as TEA; a preferred non-ionic surfactant such as perfluoroalkylpolyoxyethylene ethanol; and a solvent to form a photoresist composition which is very low in formation of fine particles (c. 2, l. 8-11) and therefore would improve the yield in the manufacture of integrated circuits (c. 1, l. 51-c. 2, l. 5).

Claim Rejections - 35 USC § 103

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

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7. Claims 16 and 18 rejected under 35 U.S.C. 103(a) as being unpatentable over Kinsho as applied to claims 1-2, 4-6, 9-15 and 17 above, and further in view of Hosaka et al. (US 5,405,720 A). Kinsho, as discussed above, teaches all the limitations of the instant claims except the specific amount of surfactant to be used in the taught photoresist composition (instant claim 16) and the use of polyethylene glycol as a suitable surfactant (instant claim 18). Kinsho does however, teach that a surfactant may be added in conventional amounts so long as this does not compromise the objects of the invention and that nonionic surfactants are preferred (c. 41, l. 45-62). Hosaka teaches a radiation sensitive composition, which may further contain a surfactant. Hosaka discloses that examples of non-ionic surfactants include polyoxyethylene alkyl ethers, polyethylene glycol dialkyl ethers and polyoxyethylene alkyl phenol ethers (c. 6, l. 61-c. 7, l. 7). The amount of surfactant incorporated into the composition is usually 2% by weight or less based on the solids content of the composition (c. 7, l. 23-28). Hosaka serves to establish that polyethylene glycol dialkyl ether is a well-known and conventional non-ionic surfactant. One of ordinary skill in the art would have been motivated by the teachings of Kinsho to use any well-known non-ionic surfactant in conventional amounts such as those taught in Hosaka in the taught photoresist composition of Kinsho in order to improve the coatability of the taught composition.

Response to Arguments

8. Applicant's arguments with respect to the instant claims have been considered they are not persuasive. Applicants argue that the prior art reference of Kinsho exemplifies a terpolymer comprising monomeric ratios outside the scope of the claimed invention. The examiner however is of the position, as stated above, that Kinsho teaches that formula (1a) can may be further combined with recurring units of at least one of formulae (2a) to (13a). Kinsho clearly teaches that it is more preferable for the polymers of the taught invention to contain (I) 30-80 mol% of units of formula (1a) derived from formula (1), (II) 5-90 mol% of units of one or more types of formulae (2a) to (13a) and optionally (III) 0-50 mol % of one or more types derived from the additional monomers (iii) (c. 20, l. 18-34). It would have been obvious to

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one of ordinary skill in the art to vary the taught components within the ranges disclosed by Kinsho wherein the third, optional monomer unit is 0 mol%.

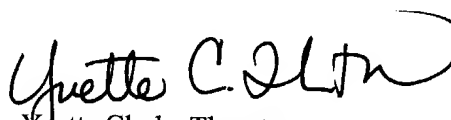
9. The closed language of the present claims does not overcome the prior art reference of Kinsho because the third taught monomer is optional and is not required to be present.

Conclusion

10. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Yvette C. Thornton whose telephone number is 571-272-1336. The examiner can normally be reached on Monday-Thursday 8-6:30.

11. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Cynthia H. Kelly can be reached on 571-272-1526. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

12. Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).


Yvette Clarke Thornton
Primary Examiner
Art Unit 1752

yct
September 18, 2004